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How did I become involved with eXist?

Through my day job

We needed a very flexible and extensible document storage system

From word of mouth we initially looked at Apache Xindice and then bad experiences led us to eXist; Commercial offerings were also considered!

We needed some additional functionality from eXist, through contact and guidance from the eXist developers we were able to develop this very easily

Any additional functionality we developed we contributed back to eXist in true Open Source style. This led to me becoming an eXist developer with commit access to the source repository.

Through my love for cutting edge technology

I also contribute to eXist outside of my day job

As an eXist developer I was invited to XML Prague 2006

I also offer consultancy when I have time; University of West of England, Nature Publishing Group, Oxford University

The Plan -

Overview of eXist

Demo of a real application

Practical Session

Local Problems

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<SPEECH>
<SPEAKER>HAMLET</SPEAKER>
<LINE>Rest, rest, perturbed spirit!</LINE>
<STAGEDIR>They swear</STAGEDIR>
<LINE>So, gentlemen,</LINE>
<LINE>With all my love I do commend me to you,</LINE>
<LINE>And what so poor a man as Hamlet is</LINE>
<LINE>May do to express his love and friending to you,</LINE>
<LINE>God willing, shall not lack. Let us go in together;</LINE>
<LINE>And still your fingers on your lips, I pray.</LINE>
<LINE>The time is out of joint: O cursed spite,</LINE>
<LINE>That ever I was born to set it right!</LINE>
<LINE>Nay, come, let's go together.</LINE>
</SPEECH>
```

What is it?

A Native XML Database

Designed specifically for storing XML, with appropriate query (XQuery/XPath) and update languages (XUpdate/XQuery update extensions)

An XML document is the fundamental unit of storage,as opposed to a tuple in an RDBMS

Oracle and SQL Server offer XML features for their database products, actual storage is in a BLOB field and you still have to use SQL to retrieve and update the data!

An application platform?

Allows storage of Binary resources
Support for XForms integration
Extensible through modules and triggers
XSLT and STX
SOAP Server – allows Web Services to be built in XQuery
Interfaces – Web Services / XML-RPC / XMLDB / REST / WebDAV / Cocoon / Servlet / ATOM

What is it? - Architecture

What is it? – The Core

Efficient Storage and Retrieval of XML Data

Index backed Storage based on node numbering

Started with Level Order Numbering
Recently switched to Dynamic Level Numbering
Indexes are map's of QNames -> (documentId, nodeId)

Tries to avoid traversal of the persistent DOM

Indexes help calculate node relationships and thus avoid traversals
DOM traversals are expensive – Memory and I/O

http://wiki.exist-db.org/space/XMLPrague2006/wolfgangs_talk.pdf

What is it? – Key Features

Written in Java. Any >1.4 compliant JVM

Native XML Indexing Storage

Transaction and crash recovery support through journal logging

XPath 1.0 / XQuery 1.0 (XQTS 94.1% passed, under aggressive development)

XSLT 1.0 and 2.0

XUpdate 1.0 and XQuery Update Extensions

XACML 1.1 and 1.0

XInclude and XPointer (partial support)

XForms 1.1

```
<SPEECH>
<SPEAKER>HAMLET</SPEAKER>
<LINE>Rest, rest, perturbed spirit!</LINE>
<STAGEDIR>They      r</S   DI
<LINE>So, gentle
<LIN        ll my  i do c  en     rov    E>
<LIN   And   t so   a man H:  - i </LI
<LI      to    his   e in    din   o you,</LINE>
<LI  God   lir  ha  ot  k   t u   i  ogether;</LINE>
<LIN        il  ur fi    s  yo      I p    </LINE>
<LINE>The time is out of joint: O cursed spite,</LINE>
<LINE>That ever I was born to set it right!</LINE>
<LINE>Nay, come, let's go together.</LINE>
</SPEECH>
```

Integration

Standalone Server (makes use of Jetty Internally)

Servlet - ship's with a minimal Jetty / Any Servlet 2.4 compliant container

Embedded – can be embedded in any Java application.
The eXist Admin client can also be run with an embedded eXist for direct single user access.

Cocoon – eXist can be built as a Cocoon block

API's and Protocols
XML:DB (SAX and DOM through XML:DB)
XML-RPC
HTTP/REST and ATOM
SOAP – eXist Web Services
XQuery/Web Services – User's XQuery can be exposed as Web Services
WebDAV

Language Specific Recommendations

Java

XML:DB – allows you to run the database either remote or embedded without changing your code.

XQJ – is still in development. JSR-225 is evolving very slowly!

.net

SOAP – .net makes it very easy to add a "web reference" to your project. eXist then appears as a local object.

SOAP Server – Your XQuery's could be stored in eXist and exposed as SOAP Web Services.

PHP

SOAP – various 3rd party libraries exist, but most seem to use SOAP. A popular library is http://www.bmuskalla.de/DB_eXist/

Perl

XML-RPC – Use cpan to install RPC::XML

What can you do with it?

Database

Document Management System (HistoryTrigger)

Content Management System (ShapeCMS)

Web Application Platform

What would you like to create?

http://demo.exist-db.org/apps/applications.xml